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Enterprise Architecture for Startups: A Case Study of an Entrepreneurial Small Food Company in Brazil

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ABSTRACT

Background: Startup companies face considerable challenges to position and to be competitive in the market. Chief among these is how to effectively encourage creativity and entrepreneurship while maintaining tight control over the operations. **Objective:** This paper proposes the analysis of a small food company (startup) in Brazil and its efforts to achieve a sustainable position in the market. Under the Enterprise Architecture perspective, it was discussed how this startup company can move ahead in a sustainable growth and diversify. To this end, an in depth interview was performed in a small food company with high growth potential. The intent is to answer both questions: (i) would an enterprise architecture strategy be convenient for this type of companies? (ii) what would be the major limitations for enterprise architecture implementation in startup companies? **Results:** the findings from the analysis reveal the company´s owners have a dilemma regarding company´s capabilities to develop. Additionally, it was found how entrepreneurial behavior affects planning and enterprise architecture implementation. In order to support a consistent growth of IT capabilities, a framework was proposed. **Conclusion:** It is possible to use Enterprise Architecture in small companies. However, internal limitations should be overcome.

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INTRODUCTION

When companies are created or new plants are installed, the owners, managers and stakeholders think primarily to assure the necessary people are hired, raw materials are bought and sales plans are reached. It is also expected everything in the new enterprise works accordingly and results appear in short term. Scarce business owners, managers and stakeholders stop to plan and discuss strategies that will provide a sustained growth (Shuman *et al*., 1985). The Enterprise Architecture could help significantly in this sense, releasing managers and specialized staff to dedicate time and effort to what really matters for the company (Ross *et al*. 2006).

Considering small companies entering in the market, the condition might be not different. The founders pursue tirelessly to gather customers and increase sales, rather than taking time to plan the future. Particularly startups are companies that usually pursue a business model that can be easily scalable and repeatable. These companies are closely related to the entrepreneurial profile of the founders. It is possible to relate them to the Mintzberg's entrepreneurial school (Mintzberg *et al.*, 2000) where strategy formulation consists in a visionary process. Indeed, according to Mintzberg & Waters (1985) this type of strategy is more common in small and / or new, in which the individual control is feasible. This occurs because the entrepreneurial strategy leaves space for adjustments along the way, and allow the reformulation of vision due to the identification of opportunities and threats of the environment.

This process is in the leaders mind who has a future vision of the organization. Strategy can be both deliberate and emergent (Mintzberg *et al*, 2000). However, as an usual entrepreneur characteristic, there is a low level of planning activities. These companies plan their future focusing what provides them more confidence about their success. One focal point should be long-term competitiveness regarding the market changes that are happening increasingly fast. If a company wishes to maintain and improve the competitiveness, it must seek for operations and organization forms that provide benefit using available resources (Chalmeta, 2001).

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To be competitive in the market, companies should have a strategic planning integrated with the enterprise architecture. As Chen *et al*. (2008: 647) stated, "Enterprise Architecture, considered as the foundation of enterprise systems engineering, has emerged as a 'tool' to help stakeholders to manage system engineering and changes". It is important to emphasize that enterprise architecture is more than Information Technology (IT). Enterprise architecture consists in how the organization's strategy will be translated and monitored in all departments and represents therefore an organizational challenge (Chen *et al*., 2008).

It is possible to find in the related literature descriptions of the implementation process of an operating model in big companies like Dow Chemical, UPS, Mc Donald's (Ross *et al*., 2006), but there are scarce studies on how small companies or start-ups understand and implement enterprise architecture. Regarding this objective, a single case study was conducted in a small food company.

To understand the company's process, one of the owners was interviewed as an exploratory phase, which aims to identify opportunities and gaps as well to propose the implementation of an operating model. In this way, this study has the main purposes of extending the EA understanding to small companies. Additionally attempts to answer questions regarding if the enterprise architecture is a suitable perspective for this type of companies and about what would be the major limitation posit by the companies to EA implementation starting with the identification of the most suitable operating models.

The article is divided in five groups. First one is the introduction. Second is the theoretical background where enterprise architecture, start-ups particularities and implementation process are presented. Third is the methodology, fourth the case study and finally the conclusion.

Theoretical Background:

The term Enterprise Architecture (EA) is an increasing research path that came from Information Technology studies. Simon (2014) suggests EA can be employed in several scenarios such as project initialization, IT consolidation, project portfolio planning, among others. Understanding the enterprise organization, targets, strategy and capabilities is the base to define the enterprise architecture that is most appropriate to the company.

In this sense, this study aims the analysis of a small food company in Brazil. As literature states, startups usually face some difficulties to access qualified resources and build a stable relationship network. Additionally, the organizational structures and routines of new firms are less developed than those of established firms. All these factors can imply some limitations and difficulties to the EA project implementation.

In this chapter, these two concepts are discussed. In sequence, it refers the EA implementation process. Then, the necessary background is outlined in order to appropriately conduct the research and reach the study objectives.

Startup companies:

According to Merriam-Webster (2015), start-up means "the act or an instance of setting in operation or motion" or "a fledgling business enterprise." The American Heritage Dictionary suggests it is "a business or undertaking that has recently begun operation". However, being a startup company is more than being new to the market. It implies the innovativeness, the freshness that suggests a "finger on the pulse of the future" (Forbes, 2013). That is clear startups are closely related to entrepreneurship. What pushes these companies are the good ideas, usually related to products and services offer, besides the high potential for financial gains.

In general, startups consist in technological firms, mostly internet related. According to SEBRAE (2015), startups are not necessarily internet companies, although their higher frequency. An singular group with an innovative idea could also be considered as a startup, on the premise that the company can show a repeatable and scalable business.

According to the Brazilian Startups Association (2015), startups usually pursue a business model that can be easily scalable and repeatable. That means the startups can rapidly assist more customers maintaining almost the same cost. This concept is adequate for some small companies. Because of this, the greatest part of data and support offer focus on assist exclusively technological startups. But that does not mean startups are only technological related companies. In 2012, a list with 45 most promising Brazilians startups was released and about twenty obtained success from new forms of offering services and products (e.g. restaurants, education, building, chocolates, ice cream) (Exame, 2012).

Carrying on a startup endeavor certainly requires entrepreneurship on the rise and entrepreneurial behavior of the founders. Therefore, it would not be wrong to state that startups firms are shaped by founders' treats. As Nelson and Winter (1982) have observed, the memory of a newly formed firm lies within its organizational actors. Helfat and Lieberman (2002) also mention the significant presence of the "founder effect". Even in some cases, the inexperience of the founders can hamper the startup performance, as state Eisenhardt and Shoonhoven (1990).

Summed to the founders influence, startups usually face some difficulties to access qualified resources and build a stable relationship network. Variations on both processes may lead to differences in their fates (Fichman and Levinthal, 1991). Additionally, by definition, the organizational structures and routines of new firms are less

developed than those of established firms.

Startups fit to the entrepreneurial school as proposed by Mintzberg *et al*. (2000), where strategy formulation consists in a visionary process. In other words, the process is in the leader (or founders) mind who has a future vision of the organization. Therefore, strategic vision is malleable, both deliberate and emergent. However, as a usual entrepreneur characteristic, there is scarce planning activities.

This paper does not have the intention to discuss entrepreneur profile, but really to demonstrate how these characteristic, inherent to startups, can affect enterprise architecture projects implementation. Before that, an essential question should be answered: is enterprise architecture strategy convenient for small companies, in particular, startup firms? What are the major limitations to the enterprise architecture projects implementation?

Enterprise Architecture:

Even though relatively recent, there is a wide range of definitions of EA in the literature. For Lankhorst (2009: 3), EA is "a coherent whole of principles, methods and models that are used in the design and realization of an enterprise's organizational structure, business processes, information systems, and infrastructure". According to Khayami (2011: 1277) "enterprise architecture is a framework to develop and maintain IT, to achieve organizational goals and to manage resources of this technology". For Ahlemann (2012: 16) it is "the fundamental organization of an enterprise as a socio-technical system, along with the principles governing its design and development". For Greefhorst (2011: 24), EA "concerns those properties of an enterprise that are necessary and sufficient to meet its essential requirements".

In order to reach the success of organizational architecture, the foundation for EA implementation should be properly planned and built. If the base is solid enough, the results are likely to be more effective. The construction of the architectural basis serves to set some functional paths using IT to release people to think innovatively and perform other intellectual activities. Ross *et al*. (2006) name this process as the 'foundation for execution', that consists in automate company's' core capabilities using IT infrastructure and digitized business processes. These core capabilities range from simple tasks as employees hiring and desktop support to more strategic ones, like sales and accountancy. The authors also emphasize the importance of taking clear decisions about what capabilities to digitize. The excessive automation could lead to less flexibility and less agility in some cases (Armour and Kaisler, 2001; Ross *et al*., 2006).

The foundation evolves with time, starting from basic services to the distinction of business capabilities. IT has a key role in this way, becoming an asset to the company. Nevertheless, most organizations see IT as technical solutions to problems created by business processes. Becomes an asset of the company when part of the solutions for the development of IT capabilities happen in a continuous flow connection and in alignment with the business model.

For this purpose, it is necessary to define the operating model the company currently has or wants to pursue. According to Ross *et al* (2006: 25), "an operating model is the necessary level of business process integration and standardization for delivering goods and services to customers, [...], the operating model is a choice about what strategies are going to be supported".

To identify an operating model for the company is necessary to know two fundamental dimensions: standardization and integration. Standardization consists in "defining exactly how a process will be executed regardless of who is performing the process or where it is completed" (Ross *et al*., 2006: 27). On the other hand, these authors define integration as the link among the organizational units and shared data.

With this understanding, a model to integrate the standardization and integration was suggested by Ross *et al*. (2006). This model can be seen in figure 1 and is constituted by four types of operating models: coordination, replication, diversification and unification.

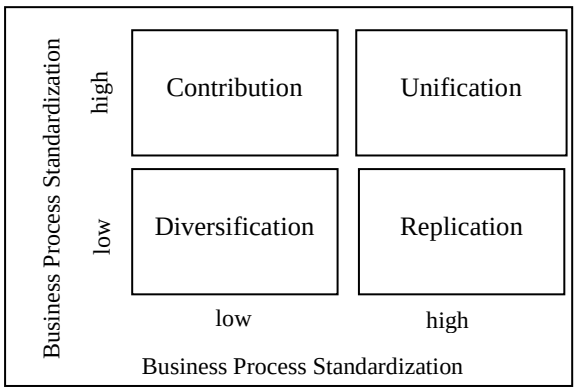

Fig. 1: Operating Models.
Source: Ross *et al*., (2006)

Diversification type is positioned in the first quadrant, where both standardization and integration levels are low. This operating model is appropriate to those companies that have few common customers, suppliers or ways of doing business among the different business the company has. There are few standardized data shared across the businesses units and transactions are independent. Coordination is positioned in high integration and low standardization quadrant. In this case, the business has an autonomous management and there is a common understanding about the process of designing the IT infrastructure services. In its turn, unification is characterized by high integration and high standardization. Normally organizations in this condition have integrated supply chains, what generates an interdependence between the different business units throughout the world. Additionally, databases as well IT decisions are centralized. Finally, replication depicts low integration and high standardization contexts (Vernadat., 1994) Company's success is dependent of efficient and repeatable business processes and not on shared customers' relationship. Growth comes from acquisition of new businesses or from building them from scratch. Controlling of processes design and IT services are both centralized.

As Almeida *et al*. (2015) point out, operating models serve as a basis for company's architecture foundation and it is an important part of strategic planning and its successful execution. While it provides proper knowledge of existent or new business, the strategy implementation follows the most adequate direction and consequently more likely to reach expected results. For Icob (2014), the first step for an organization is to build and analyze the suitable operating model before any implementation decision is made.

EA Implementation Process:

It is difficult to change the way the company does business. Additionally, there is an idiosyncratic factor: all entrepreneurs bring knowledge from their past business and educational activities that may be valuable in spotting new business opportunities (Shane, 2000) and in running firms once they are launched. Since the founders usually come from markets that are closely related, it is reasonable to expect that the founders bring with them knowledge of customer demand, products, technologies, suppliers and competitors. In summary, the greater the capability developed by the firm to expand its businesses using a particular mode, the more likely the firm is to enter a market using that same mode of entry.

Such prior knowledge may include information about how to exploit a new technology, based on prior scientific or technical training (Roberts, 1991) and about unmet customer or supplier needs in an existing market (Shane, 2000). Even when start-ups do not enter industries in which the founders were previously employed, their pre-entry experience may influence their choice of market.

In addition to redeploying pre-entry resources and capabilities in another market, firms may need to fill some resource gaps. These gaps may arise because some pre-entry resources and capabilities would be dysfunctional in the market of entry, and must be replaced with resources that better fit the market. The gaps may also arise because the firm's pre-entry experience has not equipped it with some required resources. If these gaps are substantial, and if the required resources cannot be acquired easily in factor markets or created quickly enough from scratch, firms may seek partners in order to enter markets (Helfat and Liebermann, 2002).

The convergence of people, process, and technology necessary to implement EA demands shared understanding of processes and data. Ross *et al*. (2006) emphasize the company must not only redesign and implement technical capabilities but also require its people relearn processes. Hence, the more processes are standardized, the faster is this implementation. For startup companies, it could imply in a quite complex task, considering processes are still not well defined neither standardized.

Undoubtedly, the implementation of an enterprise architecture project is triggered by the managerial perception of business risks and opportunities. There is a large body of evidence which shows that realized strategies reflect managerial perceptions rather than objective characteristics (Child, 1972; Duncan, 1972). These perceptions form the basis for managerial decisions, including the decision about EA project continuity or not. Therefore, the awareness related to EA, the risks that are implied by its absence, roll-out costs, the expected outcomes; all should be discussed exhaustively in order to align business strategy and information technologies. Therefore, it can be considered the extent EA will be applied within the company is directly related to managerial perceptions. Depending upon this perception, different IT capabilities may vary from minor, where these capabilities are developed and exploited, to major changes, where new capabilities are acquired or created.

In this sense, gathering and understanding managerial perceptions is essential to outline the EA operating model the company should pursue. It must be clear to all involved actors that the EA project consists in exhaustive and hard work of business processes integration and standardization. If managers are not aware, hardly the project will succeed (Hanschke, 2009; Ross *et al*., 2006).

The second step is quite operational: drawing the AS-IS process and TO-BE status and after define the initiatives that bridge both situations. However it can be also a tough task because that seeks the agreement between two very different spheres in the company:

business managers and IT managers (Ross *et al*., 2006; Lankhorts, 2004). The alignment is a fundamental part of the process. For this alignment a common and a clear language should be used by means of an EA representation that favors the discussions between business and IT managers. This representation of architecture can be provided through a core diagram. The third and fourth steps consist in the sequel of this task. Also the core diagram can be very helpful to locate and prioritize initiatives as well the necessary IT capabilities.

A core diagram, according to Ross *et al*. (2006) is a graphic form containing capabilities and interrelations that helps managers to effectively exploit and build the E.A. enterprise architecture. These authors outline four elements that are common to the core diagrams:

(i) Core business processes: set of processes that defines the organization's operating model;
(ii) Shared date driving core processes: customer data and suppliers shared between business units;
(iii) Key linking and automation technologies: technologies that allow the integration of applications and shared data;
(iv) Key customers: target customer groups of business processes.

The core diagram of architecture that consists in the "diversification operating model" must contain an indication of shared technologies. In addition, other factors may be considered: shared processes, identifying the specific data to the business units and identification of specific key customers for the business units.

Regarding "coordination operating model" two elements are needed: identification of key clients and sharing of data between units. Other elements may be included, if applicable: technologies necessary for data integration and connection between business processes.

For "replication operating model" other two elements are needed: identification of key processes to be standardized and identification of automation of these processes technologies. Other factors may be included in the diagram: identification of specific data for the business units and identification of specific key customers for the business units.

Finally, for "unification operating model" three elements should be considered: identification of key customers, list of processes to be integrated and standardized, and identification of data to be shared.

The identification of the appropriate operating model aligned with the organization's strategy by means of EA core diagram provides a good path for discussions and agreement within business and IT areas and consequently leads to an effective implementation of E.A. enterprise architecture.

Methodology:

Regarding the objectives, this research is characterized as descriptive. Regarding the means, this research is classified as a case study, as an empirical investigation was carried out to investigate a contemporary phenomenon in its real context as boundaries between the phenomenon and context are not clearly defined (Yin, 2005, Voss *et al*., 2002). The methodological aspects, concerning the strategy research, used to guide this study was a case study of a small food company treated qualitatively. The selected firm is a Brazilian company that produces and distributes ingredients to the domestic market, offering products for the ice cream and bakery industries, as well as providing consultancy services. The company has been operating in Brazil since 2013 and has its headquarters in Curitiba, State of Paraná. The selection was done considering it is a startup with currently no operating process, offering a promising field of study of EA and with impact for small companies contextualized in a emergent market.

According to Whittington (2006), the case study method provides a better comprehension about a complex construct (e.g. EA) as a social practice, depicting how practitioners act and interact. An in depth interview was performed with one of the owners of the company. With this interview transcript to a text editor, a content analysis was applied using Atlas.Ti®. The target of this content analysis was to identify relevant points that lead the study investigation with respect to the EA.

This study seeks, from this methodological design, to obtain a current diagnosis of the company, its current strategy; critical business processes and infrastructure of information. Hence, the first methodological step was to depict the practical reality of this manufacturing. The next goal was regarding the analysis of perceptions of the interviewee's concern about future strategic expectations of the food industry company under analysis. The reach of these two specific objectives provided a basis to answer the previously presented questions: (i) is EA strategy convenient for small companies, in particular, startup firms? (ii) If yes, how founders' profiles affect? This case study represents a typical case to answer the proposed research questions. The studied company is located in south Brazil, city of Curitiba, and was officially founded in the first semester of 2014. It produces raw material for ice cream industry. This market is very promising in the country and has big potential for expansion. The owners of company are three Italian immigrants, all of them with a visionary and entrepreneur profile, searching for new investment possibilities. With the company's establishment, they started up the production and hired two people for operational work.

The company aims to grow and to expand adding and developing other activities like consulting, exporting and even providing an "ice cream school". However, enterprise architecture design is neither in current nor in future plan of the

owners. As for primary data collection, it was performed with one of the three investors and owner of the company using a semi-structured interview. The analysis of the collected data from the interview was guided by the theoretical foundation and by the objectives established in the introduction of the article.

The applied analysis technique was the categorical content analysis in accordance with Bardin (2002). The answers obtained from the semi-structured interview were recorded and transcribed on its integral form. The content analysis was performed using the software Atlas.Ti®, which allowed the process of structured coding and graphical visualization of the relationship between the analytical categories. The duration of the interview was about ninety minutes. The transcribed interviews had about twenty-four pages, which were inserted at one only document or hermeneutic unit in this software, used as a supporting tool to manage the obtained evidences. This facilitated the analysis process, organization, information storage and control. With Atlas.Ti®, it was possible to get the first codifications of text fragments from the interviewee citations or quotations. The citations chosen were those classified as relevant and allocated in the pertinent category. Consequently, the data were related to the exposed theory. In the process of codification and elaboration of relationships found between the codes, once relevant, comments were created with the purpose of recording relevant information for future reference.

Analysis and Discussion:

According to the Brazilian association of ice cream industry (ABIS, 2014), the ice cream consumption in Brazil is growing, in special for artisanal and premium products coherent to the Italian "gelato" culture. The referred firm focus of this study, has recently contracted with one of the biggest creameries in Brazil. Indeed, it was possible to notice the current growth rate impress even the company's owners and immediate initiatives are required to prepare a foundation for execution, as mentioned by Ross *et al*. (2006). As mentioned before, an in depth interview was performed with one of the associates and then analyzed using content analysis technique. This analysis lead to a better understanding of this company's scenario and also provided enriching information about the company's strategies, targets and also highlighted some dimensions of operating model, i.e., standardization and integration levels. In addition, some limitations and rooms for improvement were detected.

A food industry company currently has more than one market and therefore the same supplier meets the purchase needs. This fact present high pulverization or diversification of clients variety while show low integration (Ross *et al*., 2006). In the case studied, the information systems are not properly developed yet, and this could represent the lack of digitalization and standardization of its current business processes. Financial controls, sales and purchasing, all are controlled using excel sheets and made by a single person which is (one of the founders). While the company still has a reduced staff and few customers, it is still easily controlled. However, it can imply a limitation for future growing. The strategic and tactical level are still represented and centralized only by the owners.

The first outcome of the content analysis was the analysis of the Business Strategy. Although the interviewee clearly demonstrates strategic thinking and presents a clear entrepreneurial profile, there is no formal strategy in the company. This is quite common in high entrepreneurial firms as mentioned before. Part of the administrative and controlling tasks are performed by the owners, by the employees of the other owner's firms, or by outsourced services. This fact represents weak integration. As the owners intend to grow on both domestic and overseas market, they should execute its strategy and IT systems through the EA perspective, starting with the definition of the operating model.

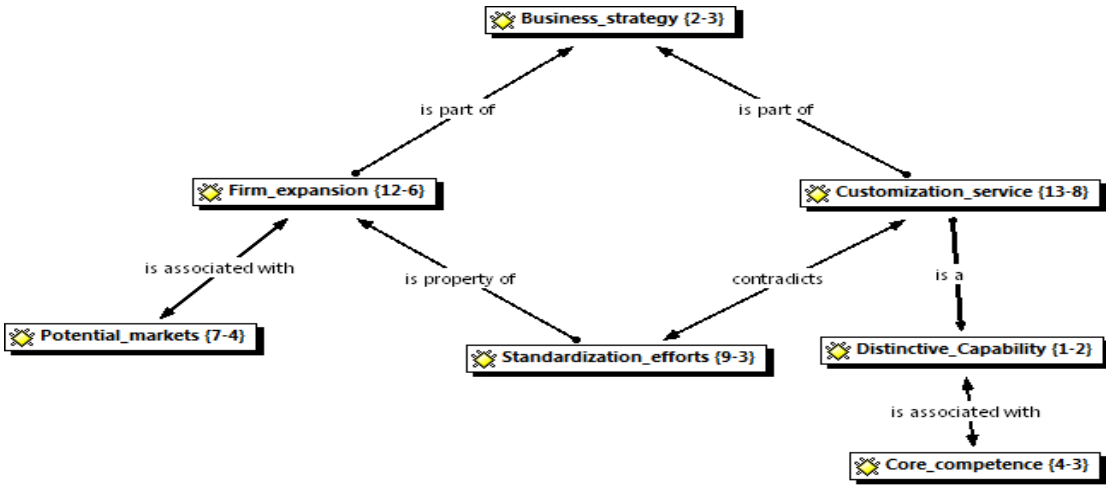

Fig. 2: Business strategy network for the food company.
Source: Interview data analysis on Atlas.ti®

Questioned about the future paths, a relevant conflict was identified: there is no consensus about medium-long term plans and the effective implementation of the previous plans. The network in the Figure 2 shows this representation. While there is an intent in limiting and standardizing the business, the company still pursues continuously for opportunities fostered by the increasing market in Brazil. This fact is detailed in the following topic.

The Current status (AS-IS) and identified rooms for improvement:

The categorical content analysis was used to analyze the interview. Currently, the company is focused on gathering more customers and this creates a first conflict: the company intent is to develop an industrial production, that will probably result in increased standardization of the products rather than the customization, which is currently considered as a strong competitive advantage. Following, the Figure 3 presents the resulting network for the category "potential markets".

The memo identified as "promotion" refers to the FISPAL (www.fispalfoodservice.com.br), one of the most prominent fairs for food product business. Product customization is undoubtedly a differentiating aspect for the firm, as emphasized by the interviewee:

[We supply] the raw material and all the related products…and the consultation [about the use of the offered products] is our differential and, depending of the case, we can produce a full customized product.

(…) in a creamery composed of 10 to 20 stores, we go there, stay about one week making tests. Testing, changing and creating new receipts.

Besides product customization, the consulting service regarding the most suitable receipts and adequate use of the products is also a differentiation factor. Together with the product customization, this whole service could be assigned as a distinctive capability of this firm and even its core competence. Questioned about the company expansion, the interviewee recognized this customization could be negatively affected due to the necessary standardization of the products.

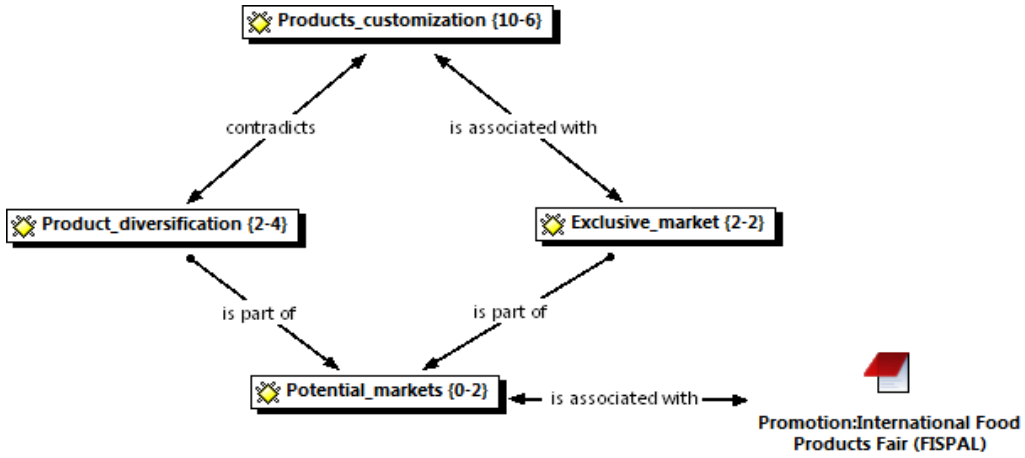

Fig. 3: Network presenting the conflicts some conflicts that emerged during the interview.
Source: Interview data analysis using Atlas.Ti®.

Still about the company expansion, other contradiction was also identified during the interview. While the company's current strategy is to gather a bigger market parcel (all the efforts on FISPAL participation as an example), there is also a concern about in which extent should the company advance and "reduce the rhythm". This contradiction can be clearly verified in the following quotes.

"Currently our focus is to reach the demand of the fair [FISPAL]. We should receive a high demand from there."

"We need to gather one industry, two or three big creameries that can make our profit of approximately 300 thousand reals per month minimum…this way we could be more relaxed and also grow in a slower pace. We are thinking about this too."

When asked about what will be the company in five years, the answer was:

"In 5 years we want to have a big facility…."

Regarding these quotations, it is possible to find out there are some inconsistencies regarding the strategic planning for the future, even in the short term. Also, the current operating model (or at least a operating systematic) of the company is neither defined, nor even planned. It was not possible to identify the foundation for execution for the company growth and potential expansion and what is currently assessed, as an opportunity could become a threat.

Future status (TO-BE) and operating model proposition:

Based on the content analysis results, including the network on Figure 2, it is possible to outline a purpose for the company's core diagram. To identify which would be the most appropriate operating

model for the company, a deep analysis of the standardization and integration levels should be performed first. Is was possible to note from the interview that the company currently does not fit any of the Ross *et al*. (2006) proposed operating models. So, a suggestion is given.

Almeida *et al*. (2015) also analyzed the company aiming to find which would be the most suitable operating model to apply. The authors pointed out the company is unable to reach its expectation and growth with the current operational aspects. They suggest the company to build and consolidate an information base that fits the internal aspects in terms of its business strengths. According to the operating model theory (Ross *et al*., 2006), there is the establishment of necessary conditions for the company to implement important and necessary changes to effectively grow. The company currently lacks some important monitoring and control mechanisms that could be implemented guided by a Replication model. Examples of tools that can be implemented with this focus is IT integrated systems, shared database, available strategic specialized systems to perform core tasks, communication network and the connection between headquarters and units

To establish a detailed TO-BE status, it is indispensable the participation of the associates. The purpose of this article is not define the TO BE state for the company but suggest an initial scope for further development. In this sense, the following core diagram is proposed. The core diagram is a representation, a stable set of company-wide capabilities the company needs to execute its operating model and respond to market opportunities. The Figure 4 depicts a general core diagram based on the diagram proposed by Ross *et al*. (2006) for Replication model. This diagram contains only an interpretative view from the interview. Is clear that this diagram needs some further deployment, adding business processes and capabilities, in particular regarding the core competences.

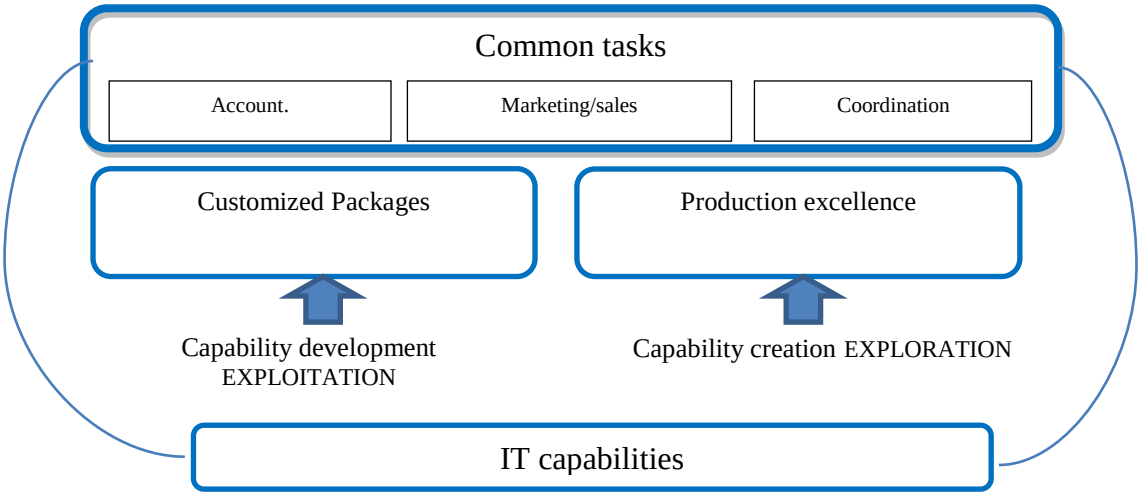

Fig. 4: General core diagram for the studied company. Source: adapted from Ross and Weill (2006).

An important information obtained from the interview is some common tasks are being standardized somehow; the administrative activities is an example. Actually, one of the associates has other company, with completely different core business and had already an administrative structure which is now used for the food company also. Therefore, accountancy, juridical support, customs agent and other operational administrative tasks are already performed in a standardized form. Connecting the efforts of organizational units and marginal services through shared data. Enable end-to-end transaction processing, or across process to alow the company to present a single face to customers (Almeida *et al*., 2015).

It is also possible to identify two possible streams of strategic approach that could be encouraged: the customized services and industrial production. Both paths could be successful, although some necessary adjustments on the company's should be done. In fact, what is proposed is that the company prepare its foundation by means of an appropriate architecture. However, how to do this without losing their principal capability, the customized services that are being currently offered and grant them an undeniable competitive advantage?

Capabilities development x Capabilities creation:

Makadok (2003) states capabilities refer to the firm's capacity to deploy resources to effect a desired end. The author complement that they consist in tangible or intangible processes that are firm-specific and are developed over time through complex interactions among the firm's resources. Therefore, capabilities cannot be easily transferred from one

organization to another and even in some cases, distinctive capabilities can lead to competitive advantage.

An important distinction between capabilities development and capabilities creation has to do with their timing. Capabilities development implies managers make their contributions largely though exploiting existent capabilities and the architecture would involve only internal readjustments and deployments. On the other hand, create a new capability is related to forming expectations about the value to their company of creating that particular capability. This process certainly requires skilled managers to properly choose which new capabilities are needed and which resources to acquire.

In the studied case, it was possible to evidence two distinctive streams of competences: the customized service, which consists in a capability to develop; and the industrial production, that will surely require entirely new capabilities. To carry on both streams in parallel and sustain competitive advantage, it is strongly recommended to build a solid foundation for execution in order to implement a robust E.A. The integration within these streams and also the standardization level could lead two different operating models to be supported within the company.

Helfat and Liebermann (2002) studied the necessary capabilities for entrants in order to reach at least paired competitivity with incumbents. According to the authors, firms usually prefer to enter in markets requiring capabilities that are similar to the company's existent ones. Then, subsequently to entry, firms may accumulate additional resources and capabilities tailored to the new products and markets, that in turn form the basis for market entry in the future. In this case, the company counts on indispensable specialized capabilities and as Helfat and Liebermann state, it affects in important ways the technologies, operations and products of the businesses in which a firm participates. Organizational knowledge also may be specialized to certain types of technologies or industries or market contexts more generally (e.g. national or regional markets).

Therefore, it is important to primarily define if both core capabilities streams shall be accessed or, as pointed out by Helfat and Liebermann (2002), after definitive market entry, the company works on accumulating additional resources and capabilities to increase its range of products and services.

IT capabilities:

IT capabilities are operational capabilities that has the important task to support the development and creation of the company's core capabilities. They are an important part of EA and the decision about which IT capabilities to use could be highly strategic for certain companies. It could be said that while EA consists in a holist solution to the company and affect its structure in fundamental ways, the IT capabilities are operational tools and tasks that serve as enables to reach this greater goal.

To identify the IT capabilities for a company, it is fundamental to learn the operating model the company pursues. With the core diagram derived from the selected model, it is possible to understand business concepts and general strategy that should be accomplished with the aid of IT capabilities. Additionally, the company owners should define exactly what would be the next stages for the company. The IT capabilities can begin with some particular but important usages, like an internal library for recipes, customized ERP systems for example.

During the interviews, it was also possible to identify some fragilities regarding information security. Customized recipes are not properly classified and the selection of IT capabilities could begin looking for a solution for this specific gap. The essential aspect of an innovative project implementation, in particular an EA project is the malleability, in other words, the ability to develop the implementation process according to company's responsiveness. Additionally, all involved managers and staff should support an ambitious project like this. Processes should be re-learned (Ross *et al*. 2006) and the need of effective collaboration of the associates is undeniable.

This overall idea of the EA project implementation follows the same idea as any innovative project conduction. Because of this, the Kline and Rosenberg's (1986) model could be applied to represent such process. The Kline & Rosenberg model, also known as Chain liked model, depicts the necessary interrelations within implementation stages. The authors emphasize the need of a constant exchange within involved actors, in particular the continuous feedback cycles. The suggested model is shown in the Figure 5.

Final considerations:

This study aimed to analyze the application of EA in a small food company. This company presents some particular characteristics that give it a startup profile. In this sense, some limitations to EA project implementation can be also identified.

Considering the results from the content analysis and the applied theoretical background, it is possible to conclude that this study achieved its proposed research objectives and properly answered both research questions.

With respect to the applicability of EA in small companies, particularly in startups, it was considered that it is perfectly possible. While EA is not the same as IT management, an EA project does not consist mandatorily on the implementation of powerful and expensive tools as some ERP packages. The EA is a strategic approach and its main intent is to support and facilitate quotidian work. With a good EA,

specialized employees can dedicate more time and effort in important and valuable tasks rather than in operational activities. As Ross *et al*. (2006: 88) suggest, companies generate benefits from "small projects addressing a specific business need as they move towards an enterprise architecture and a platform for execution". Suggestion for the managers, it would be advisable to go through a detailed study about the current core capability, which would be the customized services. Some rooms for opportunity were identified during the interview. A project regarding the information security, particularly in respect to the recipes contents and optimizations would be opportune. Besides knowledge retention, the transmission of this specialized knowledge should be carefully planned and an effort for standardization is surely desirable.

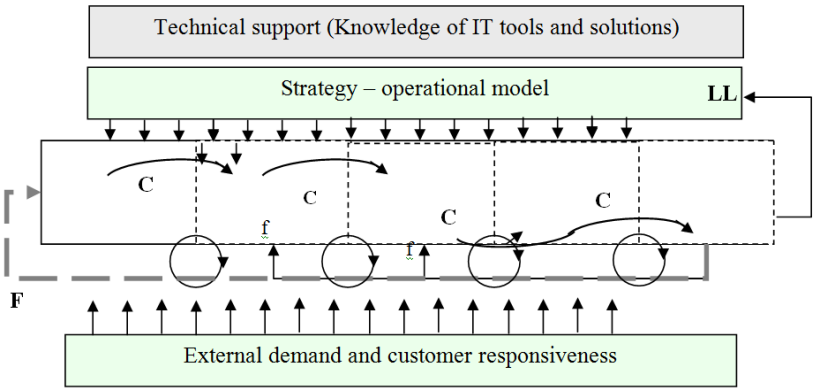

Fig. 5: Strategy operational model
Source: adapted of Kline and Rosenberg (1986)
Where:
C: is the main chain of the project implementation that occurs in stages (e.g. pilot application, further coverage, training, control).
f: indicates the feedbacks within each stage. Before go ahead to the next stage is important to monitor; further services, in particular, to the customer.
F: Final feedback, after measuring results of project implementation.
LL: Lessons learned of the whole process to the strategic team, who will use feedbacks and results to (re) formulate strategy.

Regarding the limitations to the implementation of EA projects, the entrepreneurial profile of the founders and the necessary speed of this type of company (in order to size all possible opportunities) could hamper the adequate planning and EA projects could be eventually undervalued. Particularly to the studied case, the company needs also to define the strategic path and align initiatives regarding capabilities development or capabilities creation. Perhaps to carry on both streams could become a painful job because finding qualified and experienced resources (particularly with manufacturing experience) is quite difficult.

The limitation is based upon one unique case study, made on a specific sector of a Brazilian industry. All information interpreted in this study. As a are limited to the case studied qualitatively, not statistically, which does not allow generalizations. Still it constitutes in a contribution relevant for the study of EA. For future research, is recommended to analyze other startups in different countries to check whether the same aspects are found.

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